FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

December 3 to 9, 2017 (Week 49)

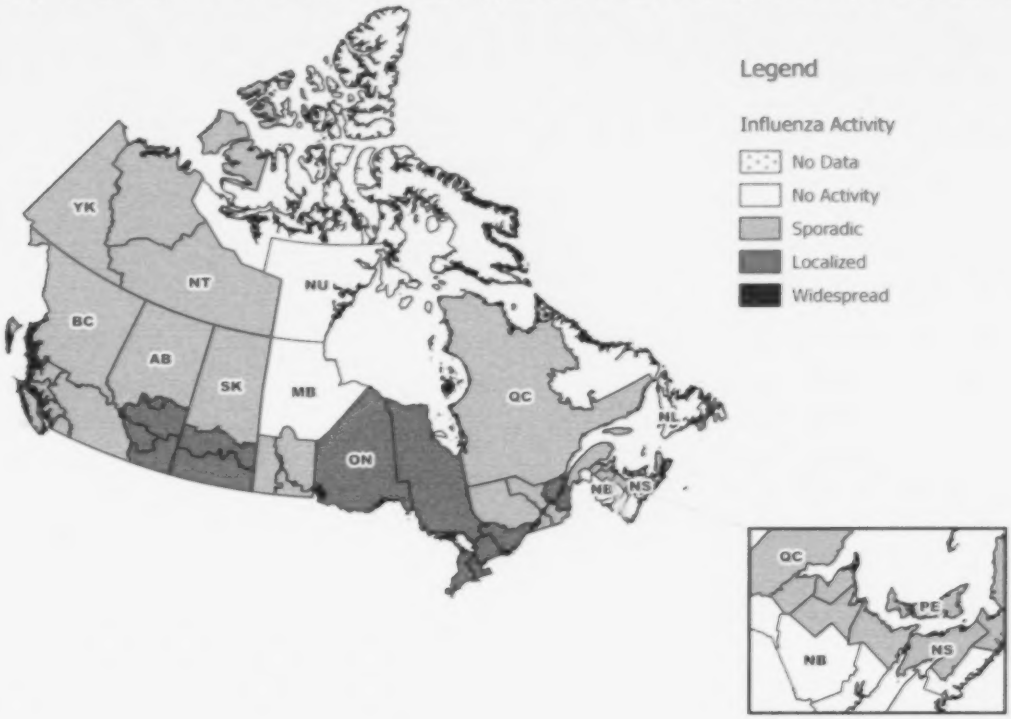
Overall Summary

- Overall, Influenza activity continues to increase across Canada; however many indicators such as hospitalizations, outbreaks and geographic spread remained similar to the previous week.
- The majority of influenza detections continue to be A(H3N2), although a substantially greater number of influenza B detections has also been reported compared to previous seasons.
- Several indicators of influenza activity are above the expected levels for this time of year, and most similar to levels observed during the 2014-15 influenza season, when A(H3N2) was the predominant circulating subtype.
- The majority of lab confirmations, hospitalizations and deaths have been among adults aged 65+.
- Since early November, an above average number of weekly pediatric hospitalizations have been reported by the IMPACT network.
- For more information on the flu, see our Flu(influenza) web page.

Influenza/Influenza-like Illness (ILI) Activity (geographic spread)

In week 49, 15 regions (AB (4), MB (1), SK (2) ON (7) and QC (1)) reported localized activity, and 25 regions (BC (5), AB (1) SK (1), MB (3), QC (5), NB (4), NS (2), PE(1), YK(1) and NT(2)) reported sporadic activity. Consistent with the early influenza activity this season, a greater number of regions are reporting sporadic and localized activity compared to previous seasons.

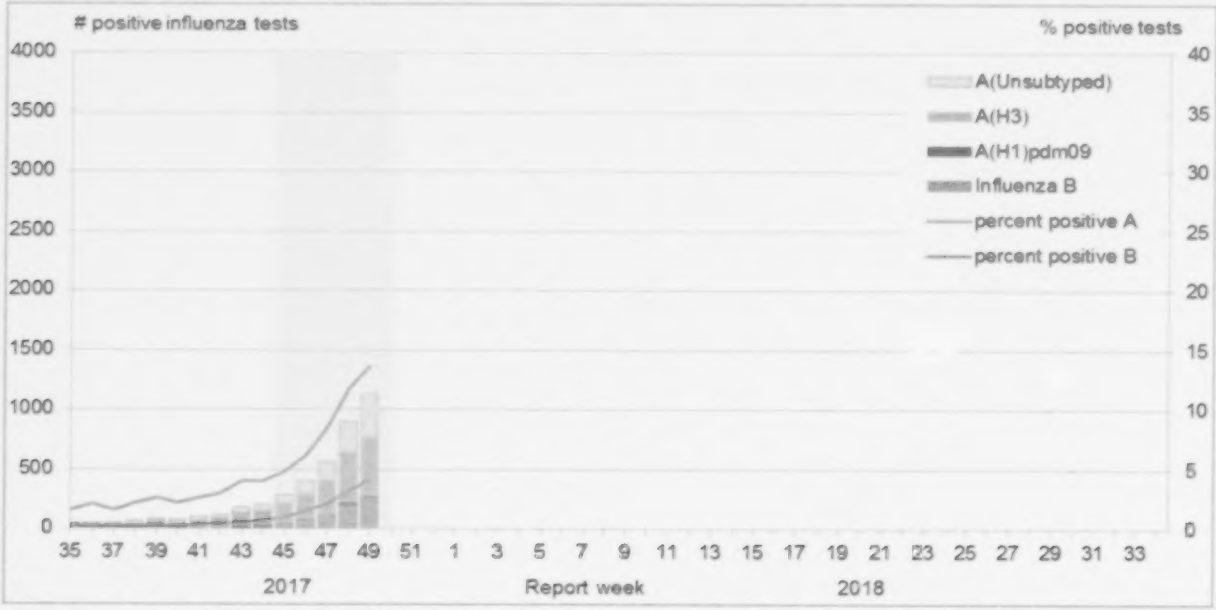
Figure 1 – Map of overall influenza/ILI activity level by province and territory, Canada, week 2017-49



Laboratory-Confirmed Influenza Detections

In week 49, both influenza A and B detections continued to increase, with 17.7% of tests positive for influenza. The number (863) and percentage (13.6%) of influenza A detections for week 49 are above average but within expected levels. The number (258) and percentage of tests (4.1%) positive for influenza B in week 49 are well above expected levels. Current levels of influenza B detections are not typically seen until mid-February. For data on other respiratory virus detections, see the Respiratory Virus Detections in Canada Report.

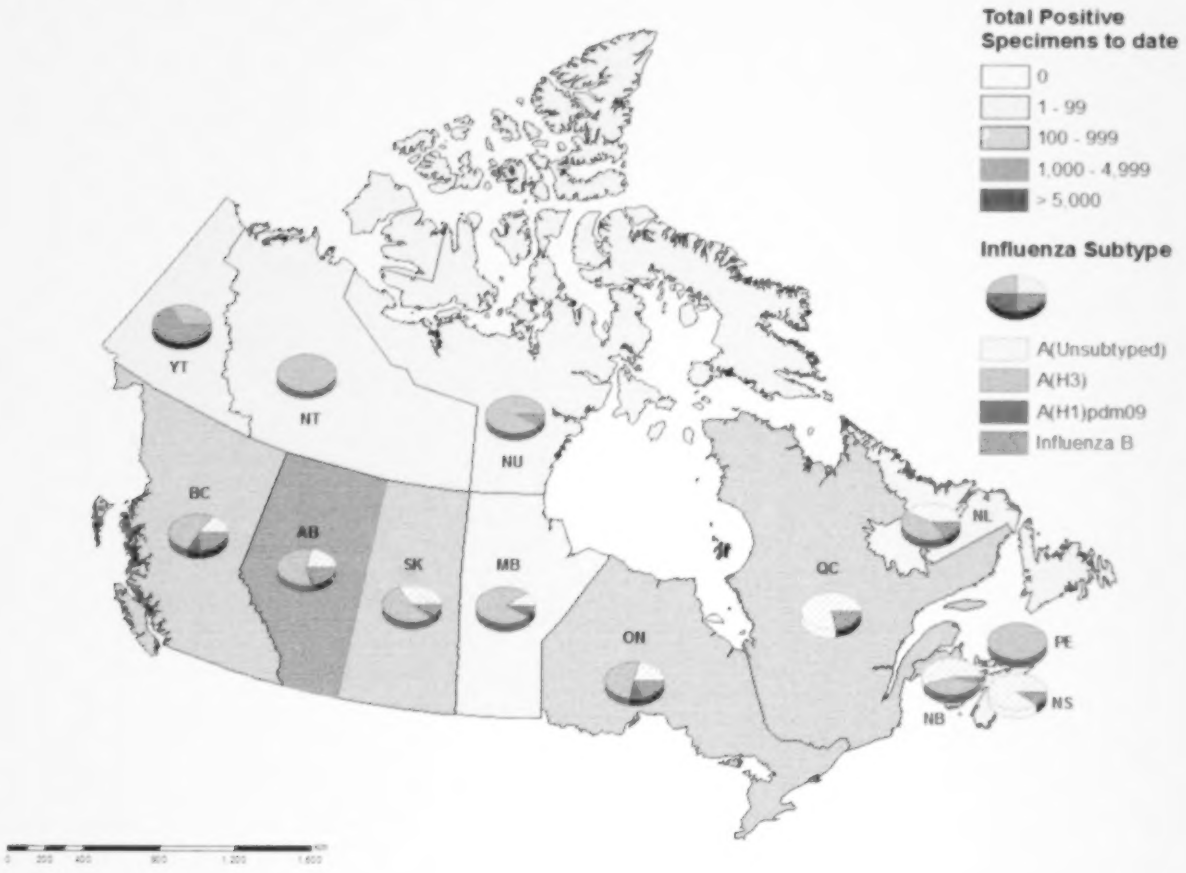
Figure 2 – Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, weeks 2017-35 to 2017-49



The shaded area indicates weeks where the positivity rate was at least 5% and a minimum of 15 positive tests were observed, signalling the period of seasonal influenza activity.

To date this season, 4,135 laboratory-confirmed influenza detections have been reported, of which 81% have been influenza A. Influenza A(H3N2) has been the most common subtype detected this season, representing 95% of subtyped influenza A detections. For more detailed weekly and cumulative influenza data, see the text descriptions for Figures 2 and 3 or the Respiratory Virus Detections in Canada Report.

Figure 3 – Cumulative numbers of positive influenza specimens by type/subtype and province/territory, Canada, weeks 2017-35 to 2017-49



To date this season, detailed information on age and type/subtype has been received for 3,809 laboratory-confirmed influenza cases (Table 1). Among all influenza cases with reported age and type/subtype information, 42% have been reported in adults 65 years of age and older. Among cases of influenza A(H3N2), adults aged 65+ represented 52% of cases, compared to 38% and 43% of cases reported at week 49 in the 2016-17 and 2014-15 season respectively.

Table 1 – Cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting, Canada, weeks 2017-35 to 2017-49

Age groups (years)	Cumulative (August 27, 2017 to December 9, 2017)						
	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)[1]	Total	#	%
0-4	221	23	131	67	49	270	7%
5-19	329	21	162	146	155	484	13%
20-44	590	28	319	243	139	729	19%
45-64	570	25	332	213	164	734	19%
65+	1373	8	1008	357	219	1592	42%
Total	3083	105	1952	1026	726	3809	100%

[1]UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available;

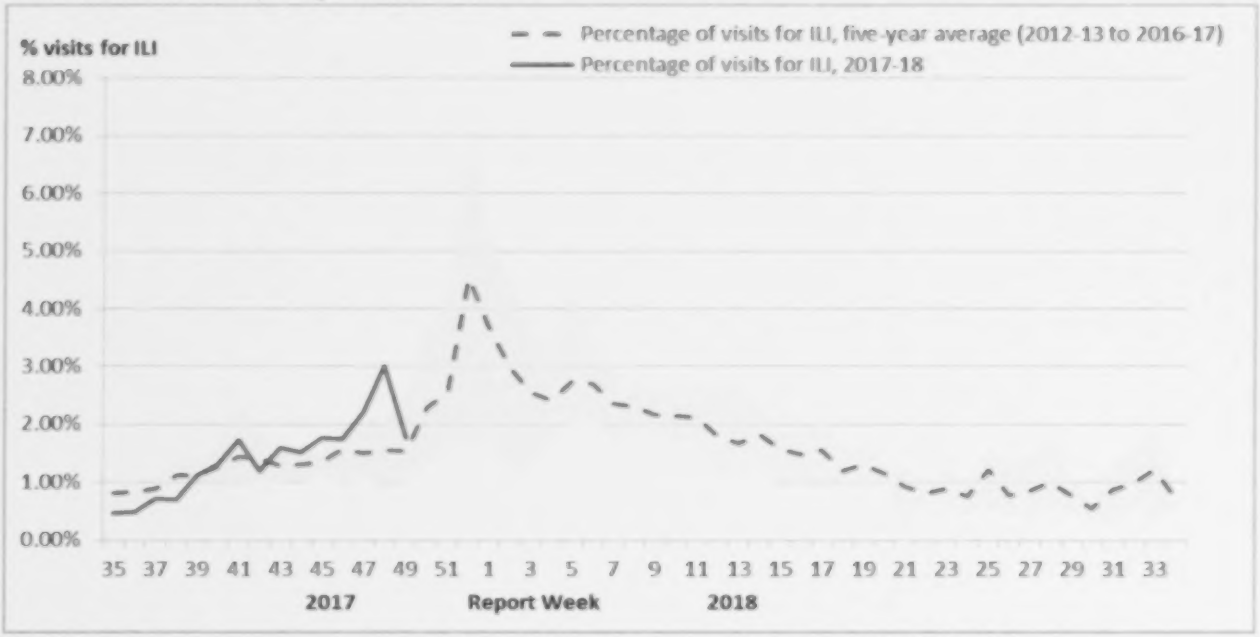
Syndromic / Influenza-like Illness Surveillance

Healthcare Practitioners Sentinel Syndromic Surveillance

In week 49, 1.8% of visits to healthcare professionals were due to influenza-like illness; a decrease compared to the previous week, and above the 5-year average.

Figure 4 – Percentage of visits for ILI reported by sentinels by report week, Canada, weeks 2017-35 to 2017-49

Number of Sentinels Reporting in Week 49: 128



The shaded area represents the maximum and minimum percentage of visits for ILI reported by week from seasons 2012-13 to 2016-17

Participatory Syndromic Surveillance

FluWatchers is a participatory ILI surveillance system that relies on weekly voluntary submissions of syndromic information from Canadians across Canada.

In week 49, 1,360 participants reported to FluWatchers, of which 3% reported symptoms of cough and fever, and 18% of these consulted a healthcare professional. Among participants who reported cough and fever, 82% reported days missed from work or school, resulting in a combined total of 98 missed days of work or school.

Table 2 – Summary of influenza-like illness symptoms reported by participating Canadians, Canada, week 2017-49

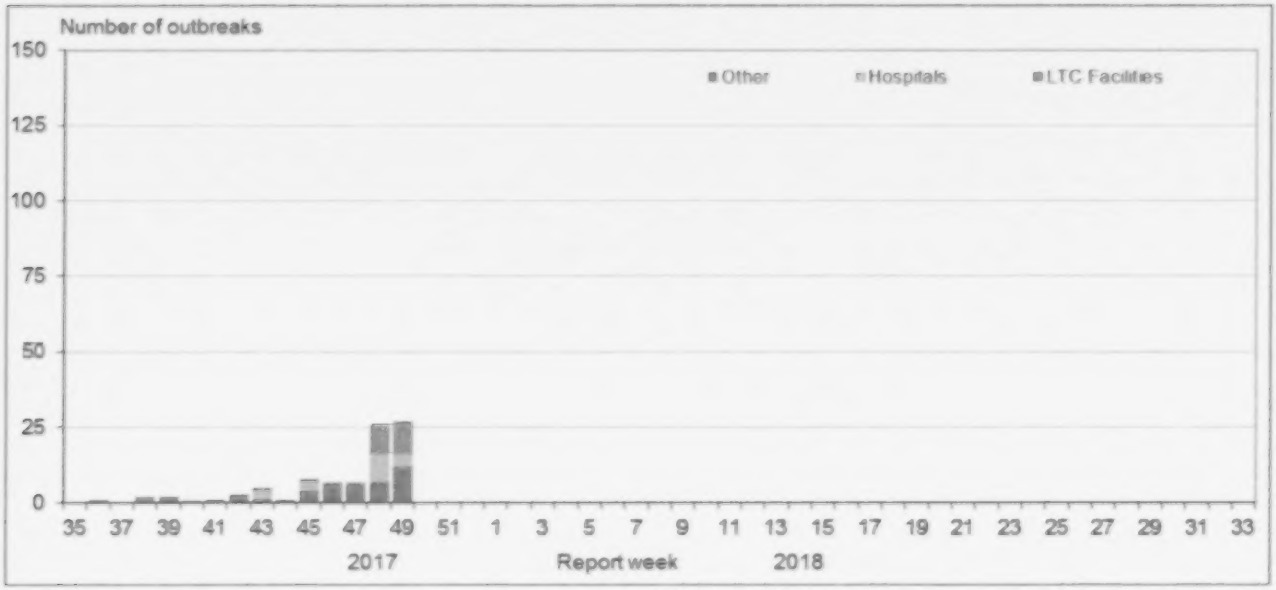
Number of Participants Reporting	Percentage participants reporting Cough and Fever	Percentage of participants with cough and fever who consulted a healthcare professional	Percentage of participants with cough and fever who reported missed days from work or school	Number of missed days from work or school
1360	3%	18%	82%	98

Influenza Outbreak Surveillance

In week 49, 27 new laboratory-confirmed influenza outbreaks were reported: 11 in long-term care facilities, four in hospitals, and 12 in other settings. Among the 26 with influenza type/subtype reported, four were associated with influenza B and 22 were associated with influenza A, of which 18 (82%) were influenza A(H3N2), 3 influenza A(unsubtyped), and one A(H1N1).

To date this season, 95 influenza/ILI outbreaks have been reported, of which 34 (36%) occurred in LTC facilities. Among the 82 outbreaks for which the influenza type/subtype was reported, 66 were associated with influenza A (of which 50 were A(H3N2)), 15 were associated with influenza B, and one was associated with a mix of A(H3N2) and B. Compared to recent influenza A(H3N2) seasons at week 49, the number of outbreaks reported this season has been greater than the 2016-17 and 2012-13 seasons, and similar to the 2014-15 season.

Figure 5 – Number of new outbreaks of laboratory-confirmed influenza by report week, Canada, weeks 2017-35 to 2017-49



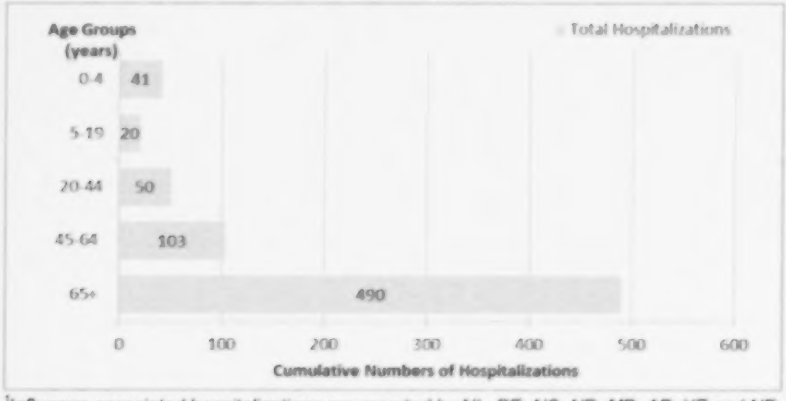
Severe Outcomes Influenza Surveillance

Provincial/Territorial Influenza Hospitalizations and Deaths

In week 49, 69 influenza-associated hospitalizations were reported by participating provinces and territories[1].

To date this season, 704 influenza-associated hospitalizations have been reported, 89% of which were associated with influenza A, and 490 cases (70%) were in adults 65 years of age or older. The number of cases is considerably elevated relative to this period in the previous two seasons. To date, 47 ICU admissions and 19 deaths have been reported.

Figure 6 - Cumulative numbers of hospitalizations by age-group reported by participating provinces and territories[1], weeks 2017-35 to 2017-49



[1]Influenza-associated hospitalizations are reported by NL, PE, NS, NB, MB, AB, YT and NT. Only hospitalizations that require intensive medical care are reported by SK.

Pediatric Influenza Hospitalizations and Deaths

In week 49, 31 laboratory-confirmed influenza-associated pediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network. Of the 31 hospitaliations, 25 (81%) were due to influenza A(H3N2). Since week 45, the number of hospitalizations reported each week has been above the seven-season weekly averages.

To date this season, 91 pediatric hospitalizations have been reported by the IMPACT network, 76 of which were associated with influenza A. Eighteen ICU admissions and fewer than five deaths have been reported. Compared to recent influenza A(H3N2) seasons at week 49, the number of hospitalizations reported this season have been greater than the 2016-17 and 2012-13 seasons, and similar to the 2014-15 season.

Figure 7 - Cumulative numbers of pediatric hospitalizations (≤16 years of age) with influenza by type and age-group reported by the IMPACT network, Canada, weeks 2017-35 to 2017-49

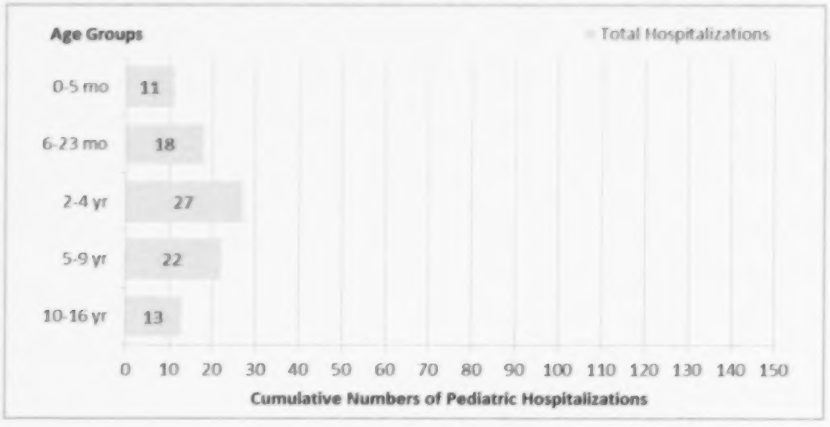
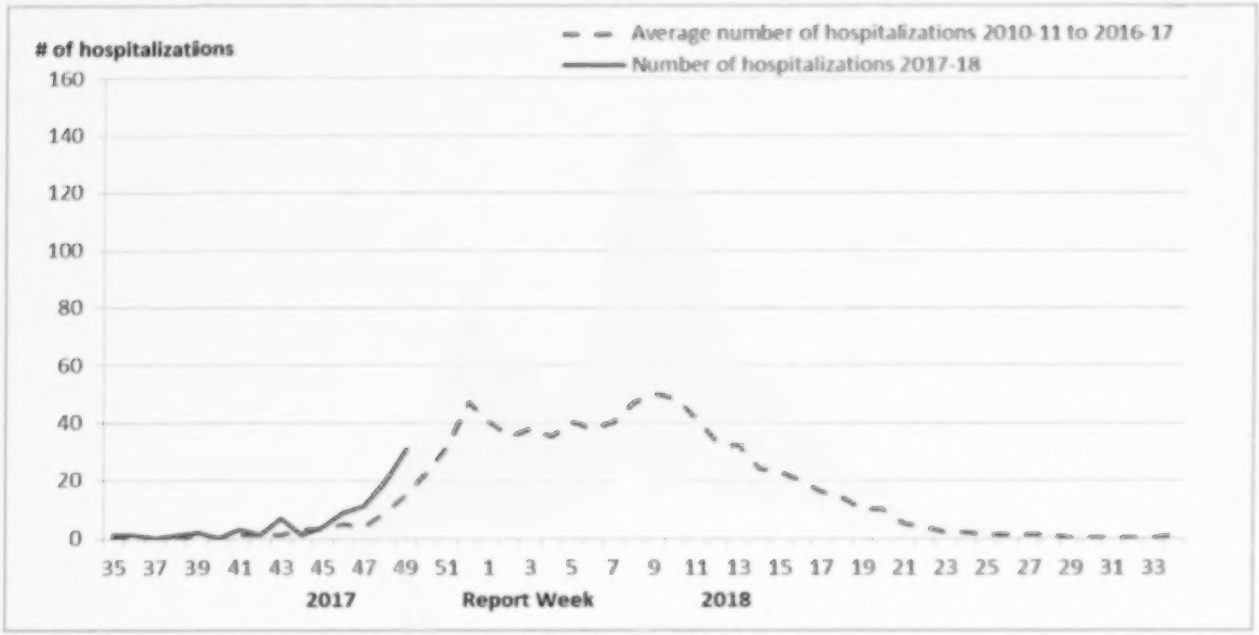


Figure 8 – Number of pediatric hospitalizations (≤16 years of age) with influenza reported by the IMPACT network, by week, Canada, weeks 2017-35 to 2017-49



The shaded area represents the maximum and minimum number of cases reported by week from seasons 2010-11 to 2015-16

Influenza Strain Characterizations

During the 2017-18 influenza season, the National Microbiology Laboratory (NML) has characterized 168 influenza viruses [131 A(H3N2), 10 A(H1N1)pdm09 and 27 B viruses] that were received from Canadian laboratories.

Antigenic Characterization

Among influenza viruses characterized by hemagglutination inhibition assay during the 2017-18 season, most viruses were antigenically similar to the cell-culture propagated reference strains recommended by WHO.

Table 3 – Influenza antigenic strain characterizations, Canada, weeks 2017-35 to 2017-49

Strain Characterization Results	Count	Description
Influenza A (H3N2)		
A/Hong Kong/4801/2014-like	31	Viruses antigenically similar to A/Hong Kong/4801/2014, the A(H3N2) component of the 2017-18 Northern Hemisphere's trivalent and quadrivalent vaccine.
Influenza A (H1N1)		
A/Michigan/45/2015-like	10	Viruses antigenically similar to A/Michigan/45/2015, the A(H1N1) component of the 2017-18 Northern Hemisphere's trivalent and quadrivalent influenza vaccine.
Influenza B		
Reduced titer to B/Brisbane/60/2008 (Victoria lineage)	4	Viruses showed reduced titer to B/Brisbane/60/2008. B/Brisbane/60/2008 is the influenza B component of the 2017-18 Northern Hemisphere's **trivalent** and **quadrivalent** influenza vaccine.
B/Phuket/3073/2013-like (Yamagata lineage)	23	Viruses antigenically similar to B/Phuket/3073/2013, the additional influenza B component of the 2017-18 Northern Hemisphere **quadrivalent** influenza vaccine.

Genetic Characterization of A(H3N2) viruses

During the 2017-18 season, 100 A(H3N2) viruses did not grow to sufficient titers for antigenic characterization by HI assay. Therefore, genetic characterization was performed to determine to which genetic group they belong. Sequence analysis showed that 74 A(H3N2) viruses belonged to genetic group 3C.2a and 26 viruses belonged to subclade 3C.2a1.

Additionally, of the 31 influenza A(H3N2) viruses that were characterized antigenically as similar to A/Hong Kong/4801/2014, 27 belonged to genetic group 3C.2a and three viruses belonged to subclade 3C.2a1. Sequencing is pending for the remaining 1 isolate.

A/Hong Kong/4801/2014-like virus belongs to genetic group 3C.2a and is the influenza A/H3N2 component of the 2017-18 Northern Hemisphere influenza vaccine.

Genetic Characterization of Influenza B viruses

Of the four viruses characterized as having reduced titer to ferret antisera produced against cell-propagated B/Brisbane/60/2008, sequence analysis showed that two of 4 viruses had a two amino acid deletion in the HA gene. Sequence is pending for the remaining two viruses.

Antiviral Resistance

During the 2017-18 season, the National Microbiology Laboratory (NML) has tested 169 influenza viruses for resistance to oseltamivir and zanamivir, and all viruses were sensitive (Table 4).

Table 4 – Antiviral resistance by influenza virus type and subtype, Canada,weeks 2017-35 to 2017-49

Virus type and subtype	Oseltamivir		Zanamivir	
	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	132	0 (0%)	132	0 (0%)
A (H1N1)	10	0 (0%)	10	0 (0%)
B	27	0 (0%)	27	0 (0%)
TOTAL	169	0 (0%)	169	0 (0%)

Note: Since the 2009 pandemic, all circulating influenza A viruses have been resistant to amantadine, and it is therefore not currently recommended for use in the treatment of influenza. During the 2017-18 season, the subset of influenza A viruses that were tested for resistance to amantadine were resistant.

Provincial and International Influenza Reports

- **Alberta** – Influenza Surveillance Report
- **British Columbia** – Influenza Surveillance
- **Manitoba** - Manitoba – Seasonal Influenza Reports
- **New Brunswick** – Influenza Surveillance Reports
- **Newfoundland and Labrador** – Surveillance and Disease Reports
- **Nova Scotia** – Respiratory Watch Report
- **Ontario** – Respiratory Pathogen Bulletin
- **Prince Edward Island** – Weekly Influenza Summary
- **Saskatchewan** – Influenza Reports
- **Québec** – Flash Grippe
- **Australia** – Influenza Surveillance Report
- **European Centre for Disease Prevention and Control** – Surveillance reports and disease data on seasonal influenza
- **New Zealand** – Influenza Weekly Update
- **Public Health England** – Weekly national flu reports
- **Pan-American Health Organization** – Influenza Situation Report
- **United States Centres for Disease Control and Prevention** – Weekly Influenza Surveillance Report
- **World Health Organization** – Influenza update
- **World Health Organization** – FluNet

FluWatch Surveillance for the 2017-2018 Season – Notes and Definitions

The FluWatch report is compiled from a number of data sources. Surveillance information contained in this report is a reflection of the surveillance data available to FluWatch at the time of production. Delays in reporting of data may cause data to change retrospectively

Influenza/Influenza-like Illness (ILI) Activity

Influenza/ILI activity levels, as represented on the map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, primary care consultations for ILI and reported outbreaks. ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls, and the detemination of an increase is based on the assessment of the provincial/territorial epidemiologist. Maps from previous weeks, including any retrospective updates, are available in the mapping feature found in the Weekly Influenza Reports.

Influenza/ILI Activity Level definitions

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported
2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†
3 = Localized: (1) evidence of increased ILI* ; (2) lab confirmed influenza detection(s); (3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region†**
4 = Widespread: (1) evidence of increased ILI*; (2) lab confirmed influenza detection(s);(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region†**;
* More than just sporadic as determined by the provincial/territorial epidemiologist.
†Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist

Laboratory-Confirmed Influenza Detections

Provincial, regional and some hospital laboratories report the weekly number of tests and detections of influenza and other respiratory viruses. Provincial public health laboratories submit demographic information for cases of influenza. This case-level data represents a subset of influenza detections reported through aggregate reporting. Specimens from NT, YT, and NU are sent to reference laboratories in the provinces for testing. Cumulative data includes updates to previous weeks. Discrepancies in values in Figures 2 and 3 may be attributable to differing data sources.

Syndromic/Influenza-like Illness Surveillance

FluWatch maintains a network of primary care practitioners who report the weekly proportion of ILI cases seen in their practice. Independent sentinel networks in BC, AB, and SK compile their data for reporting to FluWatch. Not all sentinel physicians report every week.

Definition of Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5 years of age, gastrointestinal symptoms may also be present. In patients under 5 or 65 years and older, fever may not be prominent.

Influenza Outbreak Surveillance

Outbreaks of influenza or ILI are reported from all provinces and territories, according to the definitions below. However, reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions. All provinces and territories with the exception of NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals.

Outbreak definitions:
Schools: Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI.
Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case of influenza. Residential institutions include but are not limited to long-term care facilities (LTCF) and prisons.

Workplace: Greater than 10% absenteeism on any day which is most likely due to ILI.
Other settings: two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case of influenza; i.e. closed communities.

Serious Outcome Influenza Surveillance

Provincial/Territorial Influenza Hospitalizations and Deaths

Influenza-associated hospitalizations and deaths are reported by 8 Provincial and Territorial Ministries of Health (excluding BC, NU, ON and QC). The hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting. Only hospitalizations that require intensive medical care are reported by SK.

Due to changes in participating provinces and territories, comparisons to previous years should be done with caution.

Pediatric Influenza Hospitalizations and Deaths

The Immunization Monitoring Program Active (IMPACT) network reports the weekly number of hospitalizations with influenza among children admitted to one of the 12 participating paediatric hospitals in 8 provinces. These represent a subset of all influenza-associated pediatric hospitalizations in Canada.

Influenza Strain Characterizations and Antiviral Resistance

Provincial public health laboratories send a subset of influenza virus isolates to the National Microbiology Laboratory for strain characterization and antiviral resistance. These represent a subset of all influenza detections in Canada and the proportion of isolates of each type and subtype is not necessarily representative of circulating viruses.

Antigenic strain characterization data reflect the results of hemagglutination inhibition (HI) testing compared to the reference influenza strains recommended by WHO. Genetic strain characterization data are based on analysis of the sequence of the viral hemagglutinin (HA) gene.

Antiviral resistance testing is conducted by phenotypic and genotypic methods on influenza virus isolates submitted to the National Microbiology Laboratory. All isolates are tested for oseltamivir and zanamivir and a subset are tested for resistance to amantadine.

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

This report is available on the Government of Canada Influenza webpage.
Ce rapport est disponible dans les deux langues officielles.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.